

Percent Equations

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CONCEPT

1

Percent Equations

Here you'll learn how to form equations involving percentages in order to solve problems.

Suppose that there was an article in your school newspaper that said that 80% of the students in your school plan on attending the prom. It also said that 500 students in your school plan on attending the prom. Would you be able to tell from this information how many students there are in your school? In this Concept, you'll learn how to solve equations involving percentages so that you can determine information such as this.

Watch This

For more help with percent equations, watch this 4-minute video recorded by Ken's MathWorld. [How to Solve Percent Equations](#) (4:10)

Percent Equations

15 is 25% of 60.

1) ? is 25% of 60
 $n = .25 \times 60$

2) 15 is ? percent of 60
 $15 = n \times 60$

3) 15 is 25% of what number?
 $15 = .25n$

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Guidance

Now that you remember how to convert between decimals and percents, you are ready for the *percent equation*:

$$part = \% \ rate \times base$$

The key words in a percent equation will help you translate it into a correct algebraic equation. Remember the equal sign symbolizes the word “**is**” and the multiplication symbol symbolizes the word “**of**.”

Example A

Find 30% of 85.

Solution: You are asked to find the part of 85 that is 30%. First, translate into an equation:

$$n = 30\% \times 85$$

Convert the percent to a decimal and simplify:

$$n = 0.30 \times 85$$

$$n = 25.5$$

Example B

A dime is worth what percent of a dollar?

Solution:

Since a dime is 10 cents and a dollar is 100 cents, we can set up the following equation:

$$\frac{10}{100} = 10\%$$

Example C

50 is 15% of what number?

Solution: Translate into an equation:

$$50 = 15\% \times w$$

Rewrite the percent as a decimal and solve:

$$\begin{aligned} 50 &= 0.15 \times w \\ \frac{50}{0.15} &= \frac{0.15 \times w}{0.15} \\ 333\frac{1}{3} &= w \end{aligned}$$

Guided Practice

6 is 2% of what number?

Solution:

First, use the percent equation:

$$6 = 2\% \times n$$

We can also use the fractional form of a percentage. Substitute in $\frac{2}{100}$ for 2%, since they are equivalent expressions:

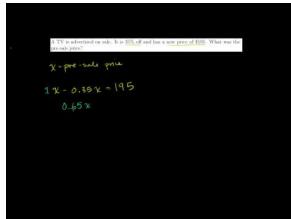
$$\begin{aligned} 6 &= \frac{2}{100} \times n \\ \frac{100}{2} \times 6 &= \frac{100}{2} \times \frac{2}{100} \times n \\ \frac{600}{2} &= n \\ 300 &= n \end{aligned}$$

6 is 2% of 300.

Practice

Sample explanations for some of the practice exercises below are available by viewing the following video. Note that there is not always a match between the number of the practice exercise in the video and the number of the

practice exercise listed in the following exercise set. However, the practice exercise is the same in both. [CK-12 Basic Algebra: Percent Problems](#) (14:15)

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Answer the following.

1. 32% of 600 is what number?
2. 50% of \$9.00 is what number?
3. $\frac{3}{4}\%$ of 16 is what number?
4. 9.2% of 500 is what number
5. 8 is 20% of what number?
6. 99 is 180% of what number?
7. What percent of 7.2 is 45?
8. What percent of 150 is 5?
9. What percent of 50 is 2500?
10. \$3.50 is 25% of what number?